BOSE MCKINNEY & EVANS LLP
2700 First Indiana Plaza
135 N. Pennsylvania Street
Indianapolis, Indiana 46204

JC658 U.S. PTO 10/12/99

JC564 U.S. PTO 09/415815 10/12/99

PATENT APPLICATION

Box Patent Application
Assistant Commissioner for Patents
Washington, D.C. 20231

Sir:

Transmitted herewith for filing under 35 U.S.C. 1.111 and 37 C.F.R. 1.53 is the patent application of:

Applicants: Erich Georg and Klaus-Peter Lindner

Title: APPARATUS FOR USE IN AN INDUSTRIAL PROCESS AND PLANT INCLUDING SUCH APPARATUSES AS WELL AS METHOD FOR SIMULATING OPERATION OF SUCH A PLANT

Atty. Docket No.: 9090-0149

Certificate Under 37 C.F.R. 1.10

Express Mail Label No.: EM139134505US

Date of Deposit: October 12, 1999

I hereby certify that this paper or fee is being deposited with the United States Postal Service' "Express Mail Post Office to Addressee" service under 37 C.F.R. 1.10 on the date indicated above and is addressed to the Assistant Commissioner for Patents, Washington, D.C. 20231.

Sherron E. Walker
Typed or Printed Name of Person Mailing Paper or Fee

Sherron E. Walker
Signature of Person Mailing Paper or Fee

Enclosed are:

- X Specification (6 pages)
- X Claims (37 claims)
- X Drawings (2 sheets)
- X Abstract
- X Two (2) Declarations and Powers of Attorney
- X Two (2) Assignments of the invention from each inventor to Endress + Hauser GmbH + Co.
- Statement(s) of Status as Small Entity
- X Check to cover the total fees for filing this application as calculated below
- X Two (2) Recordation Form Cover Sheets
- X Check to cover $80 fee for recording assignments
- X Claim of Priority
- X Priority Document
- Information Disclosure Statement
- Form PTO-1449
- Copies of Cited References
- X Preliminary Amendment

CLAIMS AS FILED

	NUMBER FILED	NUMBER EXTRA	RATE	FEE
BASIC FEE (37 C.F.R. 1.16 (a))			$760	$760
TOTAL CLAIMS (37 C.F.R. 1.16(c))	37 - 20 =	* 17	x$18	306
INDEPENDENT CLAIMS (37 CFR 1.16(b))	1 - 3 =	* 0	x$78	
MULTIPLE DEPENDENT CLAIM PRESENT	(37 C.F.R. 1.16(d))		$260	
* NUMBER EXTRA MUST BE ZERO OR LARGER			TOTAL	$1,066
If applicant has small entity status under 37 C.F.R. 1.9 and 1.27, then divide total fee by 2, and enter amount here.			SMALL ENTITY TOTAL	

FEE FOR RECORDING ASSIGNMENTS $ 80.00

TOTAL FEES $1,146.00

The Commissioner is hereby authorized to charge any additional filing fees under 37 C.F.R. 1.16 or processing fees under 37 C.F.R. 1.17 which may be required, or credit of any overpayment, to Bose McKinney & Evans LLP's Deposit Account No. 02-3223. A duplicate copy of this sheet is enclosed.

Attorney of Record
Printed Name: James A. Coles
Registration No.: 28,291

249116

BOSE McKINNEY & EVANS LLP

2700 First Indiana Plaza
135 North Pennsylvania Street
Indianapolis, Indiana 46204

PATENT APPLICATION

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Group: Unknown

Atty. Docket: 9090-0149

Applicants: Georg et al.

Title: APPARATUS FOR USE IN AN INDUSTRIAL PROCESS AND PLANT ET AL.

Serial No.: Unknown

Filed: Herewith

Examiner: Unknown

Certificate Under 37 CFR 1.10

Express Mail Label No.: EM139134505US

Date of Deposit: October 12, 1999

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Sherron E. Walker
Typed or Printed name of Person Mailing Paper or Fee

Sherron E. Walker
Signature of Person Mailing Paper or Fee

PRELIMINARY AMENDMENT

Assistant Commissioner for Patents
Washington, D.C. 20231

Dear Sir:

Preliminary to the examination of the above-identified patent application submitted herewith, applicant respectfully requests entry of the following amendment.

IN THE CLAIMS

Please amend claims 3, 4, 5, 7, 8, 9, and 11 as follows:

3. (Amended) The apparatus as set forth in claim1 [or 2], characterized in that said apparatus model (20, 22, 24) is memorized in a version permitting optimum use to be made of the available memory capacity in said apparatus (10, 12, 14).

4. (Amended) The apparatus as set forth in [any of the claims 1 to 3,] claim 1, characterized in that said apparatus model (20, 22, 24) is modifiable by means of a software program.

5. (Amended) The apparatus as set forth in [any of the preceding claims,] claim 1, characterized in that the access for reading and writing said apparatus model (20, 22, 24) is made possible by means of a software program.

7. (Amended) The apparatus as set forth in [any of the preceding claims,] claim 1, characterized in that said access authorization is configurable on said apparatus model (20, 22, 24).

8. (Amended) The apparatus as set forth in [any of the preceding claims,] claim 1, characterized in that said apparatus model (20, 22, 24) is memorizable on a data carrier and usable by a software program.

9. (Amended) A plant including several apparatuses (10, 12, 14) as set forth in [any of the claims 1 to 8] claim 1, connected to a central control unit (18) via a bus (16), characterized in that said apparatus models (20, 22, 24) are loadable into said control unit (18), that in said control unit (18) a software program is provided with the aid of which in using said loaded apparatus models (20′, 22′, 24′) the operation of said plant can be simulated for testing it in including all parameters and functionalities contained in said apparatus models (20′, 22′, 24′).

11. (Amended) A method of simulating the operation of a plant as set forth in claim 9 [or 10], characterized by it comprising the steps of loading apparatus models (20′, 22′, 24′) of said apparatuses (10, 12, 14) to be employed in said plant into said central control unit (18) and simulating the operation of said plant in including all parameters and functionalities contained in said apparatus models(20′, 22′, 24′) by means of a software program sequenced in said control unit (18).

Please add the following new claims:

--13. The apparatus as set forth in claim2, characterized in that said apparatus model (20, 22, 24) is memorized in a version permitting optimum use to be made of the available memory capacity in said apparatus (10, 12, 14).--

--14. The apparatus as set forth in claim 2, characterized in that said apparatus model (20, 22, 24) is modifiable by means of a software program.--

--15. The apparatus as set forth in claim 3, characterized in that said apparatus model (20, 22, 24) is modifiable by means of a software program.--

--16. The apparatus as set forth in claim 2, characterized in that the access for reading and writing said apparatus model (20, 22, 24) is made possible by means of a software program.--

--17. The apparatus as set forth in claim 3, characterized in that the access for reading and writing said apparatus model (20, 22, 24) is made possible by means of a software program.--

--18. The apparatus as set forth in claim 4, characterized in that the access for reading and writing said apparatus model (20, 22, 24) is made possible by means of a software program.--

--19. The apparatus as set forth in claim 2, characterized in that said access authorization is configurable on said apparatus model (20, 22, 24).--

--20. The apparatus as set forth in claim 3, characterized in that said access authorization is configurable on said apparatus model (20, 22, 24).--

--21. The apparatus as set forth in claim 4, characterized in that said access authorization is configurable on said apparatus model (20, 22, 24).--

--22. The apparatus as set forth in claim 5, characterized in that said access authorization is configurable on said apparatus model (20, 22, 24).--

--23. The apparatus as set forth in claim 6, characterized in that said access authorization is configurable on said apparatus model (20, 22, 24).--

--24. The apparatus as set forth in claim 2, characterized in that said apparatus model (20, 22, 24) is memorizable on a data carrier and usable by a software program.--

--25. The apparatus as set forth in claim 3, characterized in that said apparatus model (20, 22, 24) is memorizable on a data carrier and usable by a software program.--

--26. The apparatus as set forth in claim 4, characterized in that said apparatus model (20, 22, 24) is memorizable on a data carrier and usable by a software program.--

--27. The apparatus as set forth in claim 5, characterized in that said apparatus model (20, 22, 24) is memorizable on a data carrier and usable by a software program.--

--28. The apparatus as set forth in claim 6, characterized in that said apparatus model (20, 22, 24) is memorizable on a data carrier and usable by a software program.--

--29. The apparatus as set forth in claim 7, characterized in that said apparatus model (20, 22, 24) is memorizable on a data carrier and usable by a software program.--

--30. A plant including several apparatuses (10, 12, 14) as set forth in claim 2, connected to a central control unit (18) via a bus (16), characterized in that said apparatus models

(20, 22, 24) are loadable into said control unit (18), that in said control unit (18) a software program is provided with the aid of which in using said loaded apparatus models (20′, 22′, 24′) the operation of said plant can be simulated for testing it in including all parameters and functionalities contained in said apparatus models (20′, 22′, 24′).--

--31. A plant including several apparatuses (10, 12, 14) as set forth in claim 3, connected to a central control unit (18) via a bus (16), characterized in that said apparatus models (20, 22, 24) are loadable into said control unit (18), that in said control unit (18) a software program is provided with the aid of which in using said loaded apparatus models (20′, 22′, 24′) the operation of said plant can be simulated for testing it in including all parameters and functionalities contained in said apparatus models (20′, 22′, 24′).--

--32. A plant including several apparatuses (10, 12, 14) as set forth in claim 4, connected to a central control unit (18) via a bus (16), characterized in that said apparatus models (20, 22, 24) are loadable into said control unit (18), that in said control unit (18) a software program is provided with the aid of which in using said loaded apparatus models (20′, 22′, 24′) the operation of said plant can be simulated for testing it in including all parameters and functionalities contained in said apparatus models (20′, 22′, 24′).--

--33. A plant including several apparatuses (10, 12, 14) as set forth in claim 5, connected to a central control unit (18) via a bus (16), characterized in that said apparatus models (20, 22, 24) are loadable into said control unit (18), that in said control unit (18) a software program is provided with the aid of which in using said loaded apparatus models (20′, 22′, 24′) the operation of said plant can be simulated for testing it in including all parameters and functionalities contained in said apparatus models (20′, 22′, 24′).--

--34. A plant including several apparatuses (10, 12, 14) as set forth in claim 6, connected to a central control unit (18) via a bus (16), characterized in that said apparatus models (20, 22, 24) are loadable into said control unit (18), that in said control unit (18) a software program is provided with the aid of which in using said loaded apparatus models (20′, 22′, 24′) the operation of said plant can be simulated for testing it in including all parameters and functionalities contained in said apparatus models (20′, 22′, 24′).--

--35. A plant including several apparatuses (10, 12, 14) as set forth in claim 7, connected to a central control unit (18) via a bus (16), characterized in that said apparatus models

(20, 22, 24) are loadable into said control unit (18), that in said control unit (18) a software program is provided with the aid of which in using said loaded apparatus models (20′, 22′, 24′) the operation of said plant can be simulated for testing it in including all parameters and functionalities contained in said apparatus models (20′, 22′, 24′).--

--36. A plant including several apparatuses (10, 12, 14) as set forth in claim 8, connected to a central control unit (18) via a bus (16), characterized in that said apparatus models (20, 22, 24) are loadable into said control unit (18), that in said control unit (18) a software program is provided with the aid of which in using said loaded apparatus models (20′, 22′, 24′) the operation of said plant can be simulated for testing it in including all parameters and functionalities contained in said apparatus models (20′, 22′, 24′).--

--37. A method of simulating the operation of a plant as set forth in claim 10, characterized by it comprising the steps of loading apparatus models (20′, 22′, 24′) of said apparatuses (10, 12, 14) to be employed in said plant into said central control unit (18) and simulating the operation of said plant in including all parameters and functionalities contained in said apparatus models(20′, 22′, 24′) by means of a software program sequenced in said control unit (18).--

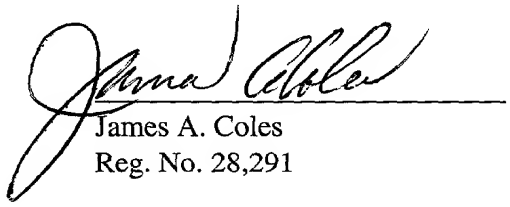
09454504.1

REMARKS

With the entry of the foregoing amendment, the application is believed to be in condition for allowance. Consideration of the claims leading to their allowance and passage of the application to issuance is respectfully requested.

Respectfully submitted,

BOSE McKINNEY & EVANS LLP



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249052

Apparatus for Use in an Industrial Process and Plant including such Apparatuses as well as Method for Simulating Operation of such a Plant

Background of the Invention

The invention relates to an apparatus for use in an industrial process in which for communicating data and control signals it is connectable to a central control unit via a bus. The invention relates furthermore to a plant including such apparatuses as well as to a method for simulating such a plant.

Nowadays, complex processes and process sequences, e.g. in operating a large industrial plant are automated. Usually, in any such plant very many apparatuses, for instance sensors, actors, valves, pumps and the like are connected via a bus to a central control unit (PC or process control system) which controls the apparatuses. In this respect one point essential for the safety and reliable functioning of the plant is the behaviour of each and every apparatus and how each interacts with the other. It is currently usual to prepare a specification for each apparatus, which is loaded into the central control unit to inform it as to the functionality and parameters of the apparatus. However, this specification is incomplete and not suitable to provide the central control unit with a comprehensive mimic image of the apparatus concerned. Plants in which apparatuses are used for which these incomplete apparatus specifications exist as loaded into the central control unit can thus be tested only on-line and also the overall behaviour of the plant resulting from how the individual apparatuses interact can only be tested and analyzed with the apparatuses on-line.

Summary of the Invention

The invention is based on the object of providing an apparatus of the aforementioned kind which is equipped so that it enables the central control unit to simulate operation of the apparatus as if it really were on-line with the central control unit via the bus. Furthermore, it is intended to provide a plant with such apparatuses, the overall behaviour of which can be simulated in the central control unit. It is still a further intention to provide a method for simulating such a plant.

The apparatus in accordance with the invention is characterized in that in the apparatus a software apparatus model is memorized which contains a comprehensive mimic image of the apparatus including its parameters, functionality and sequence programs.

The plant in accordance with the invention is characterized in that the apparatus models are loadable into the control unit, that in the control unit a software program is provided with the aid of which in using the loaded apparatus models the operation of the plant can be simulated for testing it in including all parameters and functionalities contained in the apparatus models.

The method in accordance with the invention is characterized by it comprising the steps of loading apparatus models of the apparatuses to be employed in the plant into the central control unit and simulating the operation of the plant in including all parameters and functionalities contained in the apparatus models by means of a software program sequenced in the control unit.

Brief Description of the Drawings

The invention will now be explained by way of an example with respect to the drawing in which:

Fig. 1 is a schematic diagram illustrating a plant including apparatuses in accordance with the invention,

Fig. 2 is a schematic diagram illustrating a measuring apparatus including its essential elements and

Fig. 3 is an illustration of one example application of the invention.

Detailed Description of the Invention

Referring now to Fig. 1 there is illustrated the plant comprising, for example, three apparatuses 10, 12 and 14 connected to a central control unit 18 via a bus 16. The apparatuses involved may be sensors, actors, valves, pumps, etc. Memorized in each apparatus 10, 12, 14 is an apparatus model 20, 22 and 24 resp. containing all information relevant to the apparatus, i.e. all parameters, apparatus functionality as well as the programs and sequence specification contained in the apparatus. Each apparatus model is thus a comprehensive mimic image of the apparatus so that when making use of a corresponding software program, work can be done with the apparatus model just the same as with the real apparatus.

The apparatus models can be loaded into the central control unit 18, this being indicated by 20′, 22′ and 24′.

Referring now to Fig. 2 there is illustrated schematically a measuring apparatus 26, including its essential units, equipped with an apparatus model. This measuring apparatus receives at an input stage 30 a measurement signal which is processed in a processor 32 in taking into account input parameters and limit values to then output via an output stage 34 digital data to the bus 16 for communication to the central control unit 18 or also generates an output signal which directly activates a relay. The apparatus model 28 memorized in the measuring apparatus 26 can be loaded into the central control unit 18 which then specifies a dedicated measurement signal profile and simulates the behaviour of the measuring apparatus 26 on the basis of the apparatus model 28, it thereby simulating the total sequence from measurement signal receival via processing of the measurement signal up to output of the measured value and/or signalling a relay. Processing the measurement signal is specified by the parameters and the functionalities. In regular operation of the measuring apparatus processing the measurement signal is done, of course, with respect to the parameters and functionalities in the processor thereof by programs and/or sequence definitions being processed.

When several such apparatuses including apparatus models memorized therein and the corresponding software program are put to use in the central control unit 18 a total plant can be conceived and its behaviour simulated. How the many different apparatuses react to each other in this arrangement may also be simulated in particular, thus making it possible to mimic procedurally highly critical situations in the process, and the settings and operability of all apparatuses as well as their satisfactory interaction can be tested.

Referring now to Fig. 3 there is illustrated schematically an application indicating it is also possible to considerably shorten iterative processes in setting the measuring apparatuses, an example of which is a vessel 36 to be filled at the top by means of a pump 38 and emptied at the bottom via a discharge closed off by means of an adjustable valve, a measuring apparatus 42 dictating the material level in the vessel 36. From the simulation by means of the apparatus model memorized in the measuring apparatus 42 and loadable into the control unit 18 it can be recognized directly whether the pump 36, for example, supplies more material than is discharged via the valve 40 so that the valve needs to be opened already at a lower material level. When this problem is "seen" in simulation and all relevant variables have been defined, the dimensioning thereof can be undertaken for the desired correct behaviour.

The apparatus models 20, 22, 24, 28 may also be used for simulation as independent simulation modules, e.g. held in a data base, it, of course, also being possible to memorize these apparatus models on data carriers which are loaded into the central control unit 18 from the data carrier.

Preferably, however, the apparatus models are held in the corresponding apparatuses and the connection to the central control unit is made via the bidirectional bus, the central control unit then acting like a simulation processor as influenced by the corresponding software program in simulation.

Should it turn out in simulation that the parameters contained in the apparatus model are unfavorable, they can be changed in the central control, the correspondingly changed apparatus model being then memorized in the apparatus. In this

arrangement, the changes to the apparatus model may relate not only to changes in the parameters but also to the software existing in each apparatus.

The invention now makes it possible to conceive and test industrial systems by simple ways and means without it being necessary to run the apparatuses on-line which are usually large in number.

Claims

1. An apparatus (10, 12, 14) for use in an industrial process in which for communicating data and control signals it is connected to a central control unit (18) via a bus (16), characterized in that in said apparatus (10, 12, 14) a software apparatus model (20, 22, 24) is memorized which contains a comprehensive mimic image of said apparatus including its parameters, functionality and sequence programs.

2. The apparatus as set forth in claim 1, characterized in that said apparatus model (20, 22, 24) is formulated in a uniform program language with which said functionality and said parameters of said apparatus (10, 12, 14) can be explicitly simulated.

3. The apparatus as set forth in claim 1 or 2, characterized in that said apparatus model (20, 22, 24) is memorized in a version permitting optimum use to be made of the available memory capacity in said apparatus (10, 12, 14).

4. The apparatus as set forth in any of the claims 1 to 3, characterized in that said apparatus model (20, 22, 24) is modifiable by means of a software program.

5. The apparatus as set forth in any of the preceding claims, characterized in that the access for reading and writing said apparatus model (20, 22, 24) is made possible by means of a software program.

6. The apparatus as set forth in claim 5, characterized in that access authorization to said software program for reading and writing is configurable.

7. The apparatus as set forth in any of the preceding claims, characterized in that said access authorization is configurable on said apparatus model (20, 22, 24).

8. The apparatus as set forth in any of the preceding claims, characterized in that said apparatus model (20, 22, 24) is memorizable on a data carrier and usable by a software program.

9. A plant including several apparatuses (10, 12, 14) as set forth in any of the claims 1 to 8, connected to a central control unit (18) via a bus (16), characterized in that said apparatus models (20, 22, 24) are loadable into said control unit (18), that in said control unit (18) a software program is provided with the aid of which in using said loaded apparatus models (20′, 22′, 24′) the operation of said plant can be simulated for testing it in including all parameters and functionalities contained in said apparatus models (20′, 22′, 24′).

10. The plant as set forth in claim 9, characterized in that said apparatus models (20′, 22′, 24′) are modifiable by said central control unit (18) depending on the result of simulation.

11. A method of simulating the operation of a plant as set forth in claim 9 or 10, characterized by it comprising the steps of loading apparatus models (20′, 22′, 24′) of said apparatuses (10, 12, 14) to be employed in said plant into said central control unit (18) and simulating the operation of said plant in including all parameters and functionalities contained in said apparatus models (20′, 22′, 24′) by means of a software program sequenced in said control unit (18).

12. The method as set forth in claim 11, characterized by modifying said apparatus models (20, 22, 24) by said central control unit (18) as a function of the result of simulation.

DE 197 57 359 A1

Abstract

Memorized in an apparatus (10, 12, 14) for use in an industrial process, connectable to a central control unit (18) via a bus (16) for communicating data and control signals, is a software apparatus model (20, 22, 24) which contains a comprehensive mimic image of the apparatus including its parameters, functionality and sequence programs.

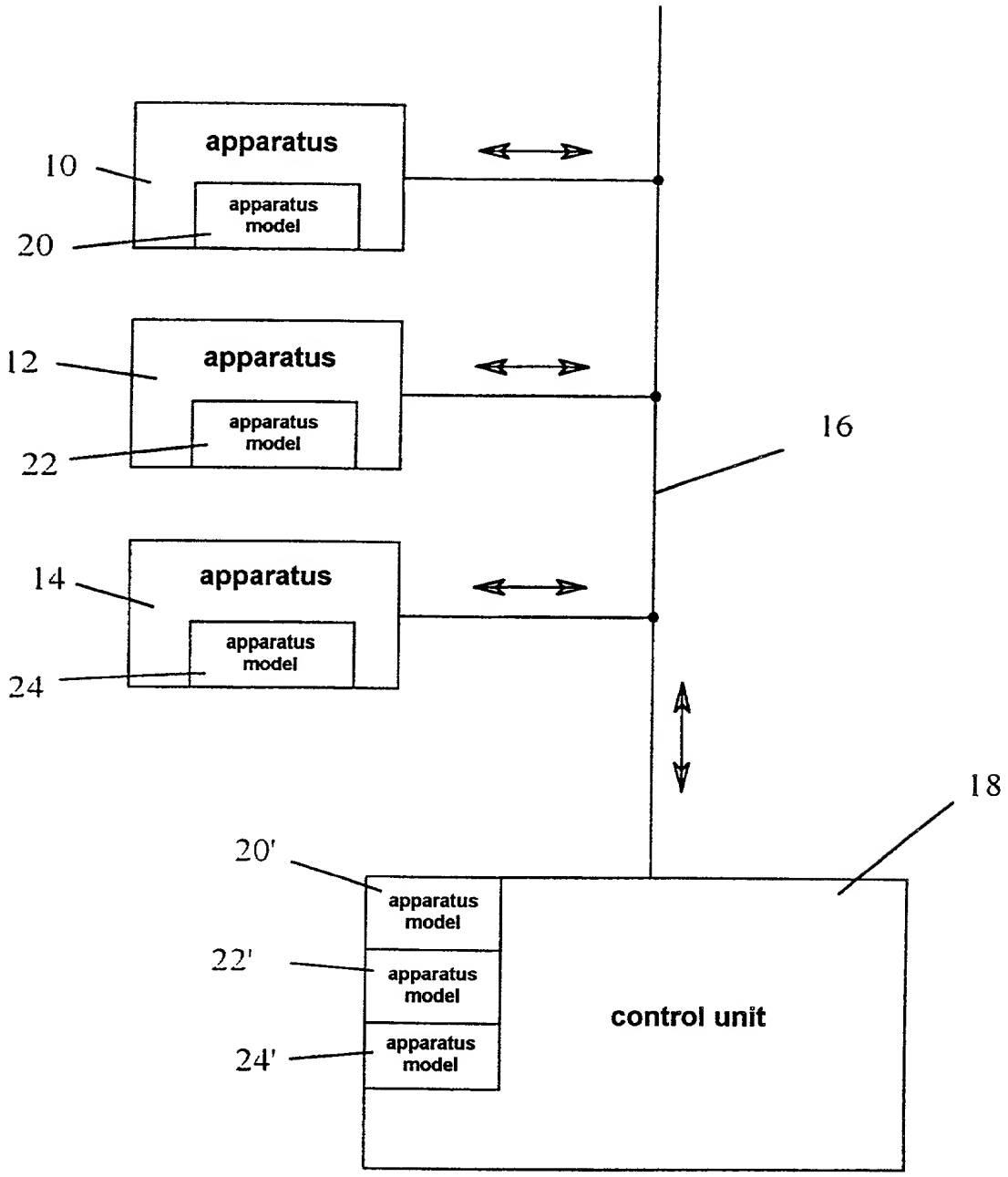
apparatus
10
apparatus model
20
apparatus
12
apparatus model
22
16
apparatus
14
apparatus model
24
18
20'
apparatus model
22'
apparatus model
24'
apparatus model
control unit

Fig.1

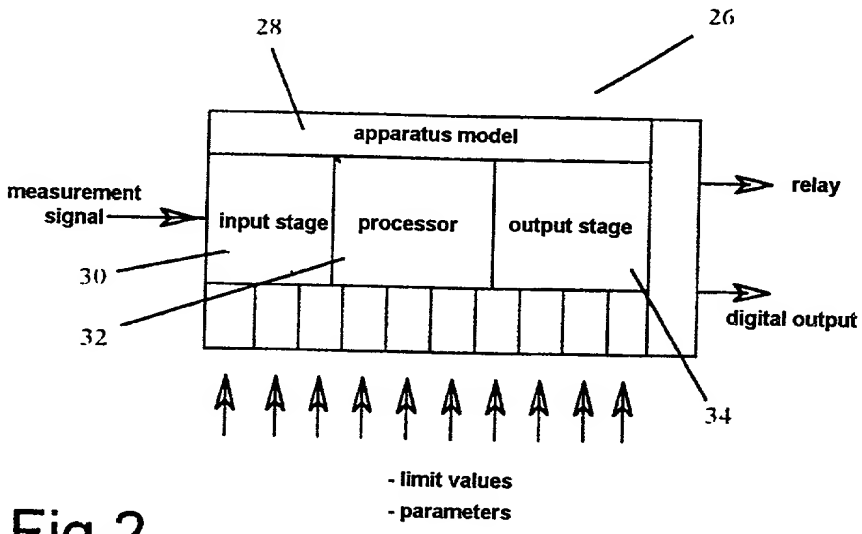
28
26
apparatus model
measurement signal
input stage
processor
output stage
relay
30
32
digital output
34
- limit values
- parameters

Fig.2

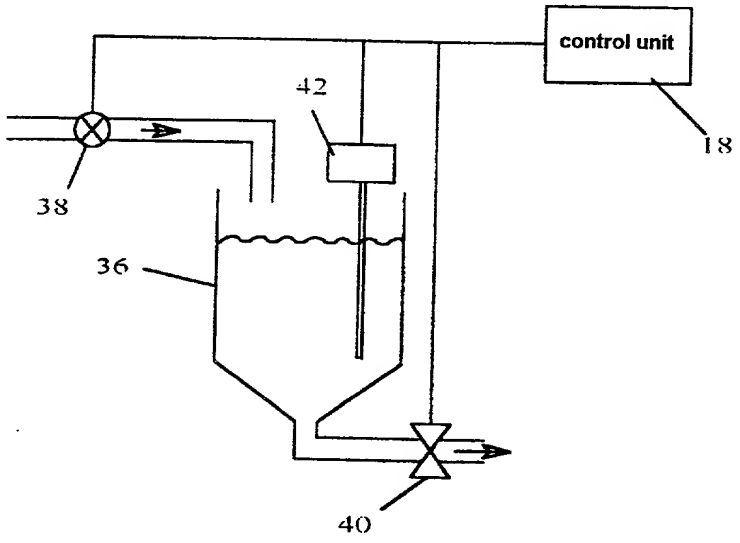
control unit
42
18
38
36
40

Fig.3

Attorney Docket No.: Eh 350 US

DECLARATION AND POWER OF ATTORNEY -- PATENT APPLICATION

As below named inventor, I hereby declare that I believe I am the original, first and sole inventor (*if only one name is listed below*) or an original, first and joint inventor (*if plural names are listed below*) of the subject matter which is claimed and for which a patent is sought in the application entitled:

Apparatus for Use in an Industrial Process and Plant including such Apparatuses as well as Method for Simulating Operation of such a Plant

the specification of which

(*check one*) X is attached hereto
_____ was filed on _____ as
United States Application Serial No. _____ or
PCT International Application No. _____
and was amended on _____.
(if applicable)

I hereby state that I have reviewed and understand the contents of the above-identified specification, including the claims, as amended by any amendment referred to herein.

I acknowledge the duty to disclose information which is material to patentability as defined in 37 CFR 1.56.

I hereby claim foreign priority benefits under 35 U.S.C. 119(a)-(d) or 365(b) of any foreign application(s) for patent or inventor's certificate, or 365(a) of any PCT international application which designated at least one country other than the United States of America, listed below and have also identified below, by checking the box, any foreign application for patent or inventor's certificate, or of any PCT international application having a filing date before that of the application on which priority is claimed.

Prior Foreign Application Number(s)	Country	Foreign Filing Date (MM/DD/YYYY)	Priority Not Claimed	Certified Copy Attached? YES	NO
98120182.5	European Patent Office	Oct.29,98	☐	☒	☐
			☐	☐	☐
			☐	☐	☐
			☐	☐	☐

☐ Additional foreign application numbers are listed on a supplemental priority data sheet attached hereto.

I hereby claim the benefit under 35 U.S.C. 119(e) of any United States provisional application(s) listed below.

Application Number(s)	Filing Date (MM/DD/YYYY)	
		☐ Additional provisional application numbers are listed on a supplemental priority data sheet attached hereto.

I hereby claim the benefit under 35 U.S.C. 120 of any United States application(s), or 365(c) of any PCT international application designating the United States of America, listed below and, insofar as the subject matter of each of the claims of this application is not disclosed in the prior United States or PCT international application in the manner provided by the first paragraph of 35 U.S.C. 112, I acknowledge the duty to disclose information which is material to patentability as defined in 37 CFR 1.56 which became available between the filing date of the prior application and the national or PCT international filing date of this application.

E 1872 US

U.S. Parent Application or PCT Parent Number	Parent Filing Date (MM/DD/YYYY)	Parent Patent Number *(If applicable)*

☐ Additional U.S. or PCT international application numbers are listed on a supplemental priority data sheet attached hereto.

As a named inventor, I hereby appoint James A. Coles, Reg. No. 28,291; E. Victor Indiano, Reg. No. 30, 143; Ronald K. Aust, Reg. No. 36,735; and Anthony P. Filomena, Reg. No. 44,108; as attorneys of record, and William S. Meyers, Reg. No. 42,884; as agent of record, with full power of substitution and revocation, to prosecute this application, and to transact all business in the Patent and Trademark Office connected therewith, and I specify that communications regarding the application be directed to:

Intellectual Property Group
Bose McKinney & Evans LLP
135 North Pennsylvania Street, Suite 2700
Indianapolis, Indiana 46204
Telephone: (317) 684-5000
Facsimile: (317) 684-5173

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under 18 U.S.C. 1001, and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

Klaus-Peter LINDNER
Full Name of Sole or First Joint Inventor

Germany
Country of Citizenship

Inventor's signature

Sep 21, 1999
Date

Moosmattweg 8/5

D-79585 Steinen
Residence and Post Office Address

Full Name of Second Joint Inventor

Country of Citizenship

Inventor's signature

Date

Residence and Post Office Address

Full Name of Third Joint Inventor

Country of Citizenship

Inventor's signature

Date

Residence and Post Office Address

214205

Attorney Docket No.: _____

Eh 350 US

DECLARATION AND POWER OF ATTORNEY -- PATENT APPLICATION

As below named inventor, I hereby declare that I believe I am the original, first and sole inventor (*if only one name is listed below*) or an original, first and joint inventor (*if plural names are listed below*) of the subject matter which is claimed and for which a patent is sought in the application entitled:

Apparatus for Use in an Industrial Process and Plant including such Apparatuses
the specification of which as well as Method for Simulating Operation of such a Plant

(*check one*) ___X___ is attached hereto
_____ was filed on _____ as
United States Application Serial No. _____ or
PCT International Application No. _____
and was amended on _____.
(if applicable)

I hereby state that I have reviewed and understand the contents of the above-identified specification, including the claims, as amended by any amendment referred to herein.

I acknowledge the duty to disclose information which is material to patentability as defined in 37 CFR 1.56.

I hereby claim foreign priority benefits under 35 U.S.C. 119(a)-(d) or 365(b) of any foreign application(s) for patent or inventor's certificate, or 365(a) of any PCT international application which designated at least one country other than the United States of America, listed below and have also identified below, by checking the box, any foreign application for patent or inventor's certificate, or of any PCT international application having a filing date before that of the application on which priority is claimed.

Prior Foreign Application Number(s)	Country	Foreign Filing Date (MM/DD/YYYY)	Priority Not Claimed	Certified Copy Attached? YES	NO
98120182.5	European Patent Office	Oct.29,98	☐	☒	☐
			☐	☐	☐
			☐	☐	☐
			☐	☐	☐

☐ Additional foreign application numbers are listed on a supplemental priority data sheet attached hereto.

I hereby claim the benefit under 35 U.S.C. 119(e) of any United States provisional application(s) listed below.

Application Number(s)	Filing Date (MM/DD/YYYY)	
		☐ Additional provisional application numbers are listed on a supplemental priority data sheet attached hereto.

I hereby claim the benefit under 35 U.S.C. 120 of any United States application(s), or 365(c) of any PCT international application designating the United States of America, listed below and, insofar as the subject matter of each of the claims of this application is not disclosed in the prior United States or PCT international application in the manner provided by the first paragraph of 35 U.S.C. 112, I acknowledge the duty to disclose information which is material to patentability as defined in 37 CFR 1.56 which became available between the filing date of the prior application and the national or PCT international filing date of this application.

E 1872 US

U.S. Parent Application or PCT Parent Number	Parent Filing Date (MM/DD/YYYY)	Parent Patent Number *(If applicable)*

☐ Additional U.S. or PCT international application numbers are listed on a supplemental priority data sheet attached hereto.

As a named inventor, I hereby appoint James A. Coles, Reg. No. 28,291; E. Victor Indiano, Reg. No. 30, 143; Ronald K. Aust, Reg. No. 36,735; and Anthony P. Filomena, Reg. No. 44,108; as attorneys of record, and William S. Meyers, Reg. No. 42,884; as agent of record, with full power of substitution and revocation, to prosecute this application, and to transact all business in the Patent and Trademark Office connected therewith, and I specify that communications regarding the application be directed to:

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Bose McKinney & Evans LLP
135 North Pennsylvania Street, Suite 2700
Indianapolis, Indiana 46204
Telephone: (317) 684-5000
Facsimile: (317) 684-5173

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under 18 U.S.C. 1001, and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

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